



## Science Pedagogy And Real Kids

# Brain Basics & Basic Science.

### Aims of the project

- Teach all incoming Year 7 students about how the brain works and what they can do to maximise learning opportunities.
- Introduce Science as a secondary school subject and teach the students about all the health and safety issues that are involved.
- Invite parents to see what their children have been doing in Science and watch their presentations, at the Year 7 Parent's Cheese and Wine evening

### Context

This project involved all Year 7 students and their teachers. It was designed to fill the first half term and give all the students the same basic Thinking Skills before starting the Science syllabus. As our boys come from a large number of feeder schools, the skills they have already developed are very varied. After completing the project, the students will have the same thinking skills foundations for us to build on. The Science introductory was of particular importance to explain about the safety issues and allow all students to use a Bunsen burner. It also allowed us to keep the students in their form groups through this project till we get their MIDYIS scores and can set the students according to ability.



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## Summary of main findings

- **ALL** the groups responded extremely well to the project and completed all the work, often to exceptionally high standards. This gave the teaching staff the opportunity to forge positive relationships with the students. This has become apparent as we are nearly a full term into the school year and only one Year 7 pupil has been referred to me for poor behaviour. This is a great improvement on previous years, when students have taken time to settle.
- The students discuss important issues such as eating the correct foods, drinking plenty of water and getting enough sleep. This has provided a sound base for us to now be able to challenge their negative behaviours and possible changes they can make.
- All of the forms had the opportunity to present their findings, with one group doing this with an outside visitor. This enabled some of the less academic to take a more prominent role and shine.
- All the students are now confident using several thinking tools to help their thinking and learning. In their Science lessons since the project they have all been using cross classification charts and other thinking tools used, with a large amount of success.
- Throughout the project, video footage of the students working and presenting their findings was taken. This has been condensed into a short DVD which is now playing in the school's entrance. This is raising the profile of the excellent work the boys did, not just with parents visiting the school, but with many people from the wider community. The boys featuring in the video are clearly very proud of this.

## Background

After 5 days of training on thinking and learning skills, I worked with dysfunctional tutor groups to help them perform better. The results were remarkable, marked improvements in students' behaviour and effort were reported.

We take students from many different feeder schools with a variety of teaching and learning styles. The levels given to us by primary teachers are not moderated between schools and can make setting the new students difficult. As a department we made the decision to complete a short term project and this seemed perfect. Gradually we try to introduce new thinking skills into our curriculum and it is important that as much as possible, the students have the same basic skills.

So far the effects reported have been positive, with students more aware of what they need to be doing to maximise their learning potential and have all completed a basic Science Safety project. This, again, when teaching students from different primary backgrounds means that all the students have the same level of basic science.



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## What we measured

Throughout the projects the students have been completing assignments to cement the learning taking place in the classroom. The standard of the homework has generally been excellent, with some examples of this attached to the report. As Science teachers we have noticed that the students have responded well to the safety in science. More importantly, as all Year 7 have now used a Bunsen burner, we can get on with teaching the units without the Bunsen burner requests every lesson.

## Teaching processes and strategies

### Brain Basics.

This unit was devised to teach the students about how the brain works and what they can do to improve their thinking and memory skills. The class worked in a variety of small groups to become experts on; brain waves, which food and drinks help and hinder learning, switch ons and switch off, brain gym and how music can help. They then had to feed back and teach their 'home group' what they had learnt. This promoted good teamwork skills as the whole group depended on each member to get it right. It also encouraged the students to take responsibility for their own learning.

### Basic Science.

This unit was devised to give the students strong foundations for scientific enquiry work. It was also a chance to ensure that all pupils understood the safety issues related to working in a laboratory and taught the correct way to light a Bunsen burner. They completed a very basic investigation and learning the correct way to write up experiments.

### Brain Basics lesson sequence.

**Lesson 1** – Draw parts of brain and discuss. Look at Traffic Lights to keep everyone in their Neo Cortex. Look at emotions.

**Lesson 2** - Class splits into 'expert groups' to learn about brainwaves/music/Brain gym/switch on & off's/food & water.

**Lesson 3 & 4** – Class goes back to 'home groups' to feedback. Each expert gets to teach the rest of their group about their topic.

Go back to expert groups and complete a P<sup>3</sup>T for each area.

**Lesson 5** - quick test, write 10 things that help learning and 10 things that stop, collate answers on Venn Diagram on the board.

**Lesson 6** – Complete a mind map sheet then create a mind map for anything (hobby/sport/nutrition). Keep checking the criteria!

**Lesson 7** – VAK/M.I. sheets. Discuss who is good at what and what that means.

**Lesson 8** – Complete 'Who shows these Multiple Intelligences' sheets.

**Lesson 9** – prepare presentations. Presentation has to be in keeping with personal Multiple Intelligence i.e. picture, model, poster, drama, song etc.

**Lesson 10 - Presentations and Celebrations** show and tell!



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## **Basic Science lesson sequence.**

**Lesson 1** – Discuss the ways in which Science is different from other subjects – **SAFETY**. Create a class set of class safety rules.

**Lesson 2** – Get out all equipment and match the words to their equipment and to their jobs.

**Lesson 3** – Get out all equipment again and discuss how we draw in science. 2D, pencil and ruler to draw, ink to label. Complete Science Equipment sheet.

**Lesson 4** – Introduce Bunsen Burners. How do we light them and use them. Practice lighting Bunsen burners properly.

**Lesson 5** – Revision, Safety test and Bunsen burner tests.

**Lesson 6** – Plan 'Ice → water → steam' experiment. Melt ice in a funnel and conical flask, then boil the water, taking the temperature every minutes and recording when the water changes state.

**Lesson 7** – Carry out the experiment. Discuss all safety issues and the correct way to turn on Bunsen burners first.

**Lesson 8** – Draw a line graph of results.

**Lesson 9** - Write a conclusion and evaluation. Discuss making experiments 'fair'.

## **Findings**

As a result of this project the students have a clear understanding of the environments which aid and hinder learning. The students also have some basic knowledge of how to write up an investigation and carry out a practical experiment safely. This is a very useful basis to build on.

The Scheme of work was very successful. However, we did come across a few difficulties. A member of staff was not confident teaching the emotions and brain basics units so we swapped classes half way through the unit. She took my basic science and I took her Brain Basics. This actually worked out very well as we both got to develop good relationships with more students. Also, sadly, the last week of the project I was taken to hospital so missed the celebratory presentations. We are hoping to repeat this with future Year 7 cohorts and staff agree they are more confident to teach it again in the future.

"Brain Basics gave pupils confidence to tackle problems independently. It allowed them to be creative and more open minded about Science by using a different perspective. Basic Science gave pupils clear objectives; safety and understanding which will help them throughout their science education." Karen Mills, Science Teacher.

"Its been great in Science with Miss Strain last term, we done all things about Brain Gym and everything and we went at the front in fours and we had to talk about stuff that we done and Miss done a video when we were at the front." Prichard, 7w.

"In brain basics we created a video using the overhead projector. We put our sheet we created on it and we had to talk about brain waves, music, food and water and brain gym. In Basic Science we did experiments using the Bunsen burner we made sparklers and know some symbols for our equipment." Usaamah 7w

"I enjoyed the project, especially the brain basic. I enjoyed this because I didn't know anything about it so everything was new to me. The basic science was also good. The best part of that was burning magnesium." Leon 7w



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## Conclusions

- The students enjoyed the project.
- The staff enjoyed the project.
- All students now have some knowledge of how the brain works and what type of environment is most conducive to learning.
- All students have some knowledge of our emotions and how to recognise them in other people.
- All students now have some knowledge of how to write up a scientific investigation and the safety aspects with regards to scientific experiments.
- The confidence of many of the pupils has developed through presenting their findings to the class in a very non-threatening, relaxed environment.
- Through working in small groups with new people at the start of the year, we have found that the boys are now much more open to working in groups defined by the teacher, as apposed to only working with their friends.

## Useful materials

Lane Clarke Brain Basics immersion experiences.

[www.laneclark-ideasys.com](http://www.laneclark-ideasys.com)

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